

2. The method of claim 1 wherein the cycle time is less than or equal to 5 milliseconds.
3. The method of claim 1 wherein the first value is specified for the effective valve flow coefficient and the second value is determined for the initial air volume.
4. The method of claim 3 wherein the first value is a number ranging between about 0.1 to about 1.4.
5. The method of claim 4 wherein the cycle time is less than or equal to 5 milliseconds.
6. The method of claim 1 further comprising the steps of:
heating the liquid received by the dispenser body with a heater; and
thermally insulating the housing of the pneumatic actuator from the heater for reducing the transfer of heat from the heater to the housing so that
5 the solenoid valve is mountable in abutting, thermally-conductive contact with the air piston housing.
7. The method of claim 1 wherein the first value is specified for the initial air volume and the second value is determined for the effective valve flow coefficient.

8. The method of claim 7 wherein the initial air volume is less than about 2170 mm³.

9. The method of claim 8 wherein the initial air volume is less than about 1500 mm³.

10. A liquid dispensing module for dispensing a liquid onto a substrate,
comprising:

a dispenser body having a discharge outlet, said dispenser body capable
of receiving a flow of the liquid and discharging the flow of the liquid from said

5 discharge outlet, said dispenser body including a flow-control mechanism
having an open position in which the flow of the liquid is discharged from the
dispenser body and a closed position in which the flow of the liquid is blocked;

an actuator operatively coupled with said flow-control mechanism, said
actuator capable of actuating said flow-control mechanism between the open
10 and the closed positions to selectively dispense the liquid from said dispenser
body; and

a nozzle removably mounted to the dispenser body in fluid
communication with said discharge outlet.

11. The liquid dispenser module of claim 10 wherein said nozzle includes a frustoconical portion and said dispenser body includes a frustoconical recess capable of receiving said frustoconical portion.

12. The liquid dispenser module of claim 10 wherein said dispenser body further includes a threaded passageway and a set screw threadingly received within said threaded passageway, said set screw having a conical tip, and said nozzle includes a conical recess capable of receiving said conical tip of said set
5 screw so as to apply a holding force between the frustoconical portion and the frustoconical recess.

13. A liquid dispensing module for dispensing a liquid onto a substrate, comprising:
- a dispenser body having a liquid inlet, a discharge outlet, a liquid recirculation outlet, and a flow channel capable of directing a flow of the liquid
 - 5 from said liquid inlet to one of said outlet and said recirculation outlet;
 - a first valve seat disposed in said flow channel between said recirculation outlet and said liquid inlet;
 - a second valve seat disposed in said flow channel between said discharge outlet and said liquid inlet;
 - 10 a first valve stem segment having a first valve plug located between said first valve seat and said recirculation outlet;
 - a second valve stem segment having a second valve plug located between said second valve seat and said discharge outlet, said second valve stem segment operatively coupled for movement with said first valve stem
 - 15 segment, said first and said second valve stem segments being movable between a first position in which said first valve plug contacts said first valve seat to stop the flow of the liquid from said liquid inlet to said recirculation outlet and said second valve plug is out of contact with said valve seat to permit the flow of the liquid from said liquid inlet to said discharge outlet and a second
 - 20 position in which said first valve plug is out of contact with said first valve seat to permit the flow of the liquid from said liquid inlet to said recirculation outlet and said first valve plug contacts said first valve seat to stop the flow of the liquid from said liquid inlet to said discharge outlet; and
 - an actuator associated with said dispenser body, said actuator
 - 25 operatively coupled with one of said first and said second valve stem segments

to selectively apply an actuation force for moving said first and said second valve stem segments to provide said first and said second positions for selectively dispensing the flow of the liquid from said discharge outlet.

14. The liquid dispenser module of claim 13 wherein said actuator is operatively coupled with said first valve stem segment.
15. The liquid dispenser module of claim 13 wherein said first valve plug is a spherical head and said first valve seat has an annular sealing surface capable of making a sealing engagement with said spherical head.
16. The liquid dispenser module of claim 13 wherein said second valve plug includes a first frustoconical sealing surface and said second valve seat includes a second frustoconical sealing surface capable of making a sealing engagement with said first frustoconical sealing surface.
17. The liquid dispenser module of claim 13 further comprising a first biasing element for applying a first biasing force to said first valve stem segment that urges said first valve plug in a direction toward said first valve seat.
18. The liquid dispenser module of claim 17 further comprising a second biasing element for applying a second biasing force to said second valve stem segment that urges said second valve plug in a direction toward said second valve seat.

19. The liquid dispenser module of claim 18 wherein said second biasing force is greater than said first biasing force so that said first and said second valve stem segments are in said second position when said actuation force is not applied.

20. The liquid dispenser module of claim 18 wherein the sum of said first biasing force and said actuation force is larger than said second biasing force so that said first and said second valve stem segments are in said second position when said actuation force is applied.